Mobile Phone Technology for ALL: Towards Reducing the Digital Divide

Diane Nelson Bryen
Temple University, USA & University of Pretoria, South Africa

Enid Moolman
University of Pretoria, South Africa

INTRODUCTION

Use of cell phones has grown dramatically. By the turn of this century, cell phone use had reached a majority of the populations in Canada, the United States, Australia, Germany, Singapore, the United Kingdom, and Italy. However, a digital divide exists between people with and without disabilities in their use of mobile phones. Gaps in usage occur across all age groups. In a study by Bryen, Carey and Potts (2007), only 20% of adults with significant communication disabilities used cell phones. Yet, the need for cell phones has been expressed more than a decade ago to improve health and safety; manage transportation; and communicate with employers, friends, and families (Bryen & Pecunas, 2004). Similar needs have been expressed by adults with intellectual disabilities (Bryen, Carey & Friedman, 2007).

Given the expanding capabilities of mobile phones for communication, access to information, commerce, entertainment, and health and safety, without access to those technologies people with intellectual and those with communication disabilities will be further isolated and marginalized in society. Consequently, the promise of the UN Convention on the Rights of Persons with Disabilities (CRPD) will not be realized.

In this article mobile phone technology includes cell phones and smartphones that enable individuals with and without disabilities to communicate and access information. Cell phones are portable telephones that use wireless cellular technology to send and receive phone signals.

An outgrowth of cellular technology is smart phones or smartphones. According to *Phone Scoop* (2014) a smartphone, is "a category of mobile device that provides advanced capabilities beyond a typical mobile phone. Smartphones run complete operating system (OS) software that provides a standardized interface and platform for application developers. Most smartphones contain features such as calendars, media players, GPS navigation, web browsing, Wi-Fi, and third party applications and accessories.

Digital divide is defined as the gap between those with regular, effective access and ability to use digital technologies and those without (Boyera, 2004). The digital divide is a social issue, given that the divide is based on age, education, race, household income, and disability status (Feingold, 2013; Jackson, Kolenic, Fitzgerald, Harold, & Von Eye, 2008; and Zickuhr & Smith, 2012).

Augmentative and Alternative Communication (AAC) is an umbrella term that encompasses the communication methods used to supplement or replace speech or writing for those with impairments in the production or comprehension of spoken or written language (Wikipedia, 2014). For the purpose of this article, we have focused primarily on speech generating devices.

United Nations Convention on the Rights of Persons with Disabilities (CRPD) is an international human rights and development treaty to

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protect the rights of persons with disabilities and ensure that discrimination based on disability does not occur. It was ratified on 30 November 2006. Article 9 of the CRPD focuses on accessibility, including access to information and communication technologies.

OVERVIEW

According to the Pew Research Internet Project (Fox, 2011), one in four Americans live with a disability that interferes with activities of daily living, including serious difficulty walking; concentrating, remembering, or making decisions; hearing; seeing, even with eye glasses; doing errands such as visiting a doctor's office or going shopping; or dressing or bathing. This national study also found that 46% of adults with a disability live in households with $30,000 or less in annual income. Twenty-six percent (26%) of adults without disabilities live in households with a similar level of income. They are also likely to have low levels of education and are likely to be older. Similar findings were found in the American Community Survey, the Current Population Survey, and the U.S. Consensus.

Similarly, according to the World Health Organization and the World Bank (2011), some 785 million people worldwide have a significant physical or mental disability (Brown, 2011; World Health Organization & The World Bank, 2011). Mirroring the findings from the United States, those with disabilities worldwide have lower levels of income, are likely to have low levels of education and are likely to be older than those without disabilities.

While assistive technologies can be powerful tools to increase independence and improve participation, the absence of these devices and services continues to be a major barrier worldwide. According to the Assistive Technology Act of 2004, an assistive technology device can be defined as " any item, piece of equipment, or product, whether it is acquired commercially, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities. Examples of assistive devices include:

- Crutches, prostheses, wheelchairs for people with motor impairments.
- Assistive listening devices for those with hearing impairments.
- White canes, magnifiers, software for screen magnification and reading for people with visual impairments.
- Communication boards and speech synthesizers for people with speech impairments.
- Devices such as day calendars with symbol pictures for people with cognitive impairments (World Health Organization and The World Bank, 2011).

In some countries, assistive devices and services are provided by government programs, through rehabilitation services, vocational rehabilitation, or special education agencies; insurance companies, and charitable and nongovernmental organizations. However, in other countries, they must be purchased through private means. As a result, many children and adults throughout the globe fail to acquire these needed assistive technologies to enable them to benefit from public education, to obtain jobs, to communicate with friends and family, and to live more independently in the community.

To compound this barrier to independence and community participation, people with disabilities suffer from what has been defined as the digital divide. The digital divide is defined as the gap between those with regular, effective access and ability to use digital technologies and those without (Boyera, 2004). The digital divide is a social issue, given that the divide is based on age, education, race, household income, and disability status (Feingold, 2013; Jackson, Kolenic, Fitzgerald, Harold, & Von Eye, 2008; and Zickuhr & Smith, 2012).